

ABANDONED MINE SAFETY AND MINING RECLAMATION EDUCATION MATERIALS DEVELOPMENT PROJECTS

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ABSTRACT

The National Energy Foundation (NEF), as an outgrowth of the Utah Mineral Resources and Mining Education program identified a need for additional supplementary educational resources that could be used by teachers and students to enhance and enrich classroom instruction. As a consequence, NEF initiated and is carrying out the development of two instructional posters and primers dealing with Abandoned Mine Safety and Mining Reclamation. NEF has conducted research, prepared the materials in phases, and is currently distributing the materials in teacher training workshops and directly to teachers in a variety of ways. The reclamation phase was completed first, the abandoned mine safety component is presently under development and will be completed prior to the NAAMLPS Conference.

The project has been extremely well received by the education community and directly relates to the work of the National Association of Abandoned Mine Land. NEF proposes to describe the materials development process including design and methods. We will explain and distribute items that have been made and show how they are used and explain additional implementation and distribution opportunities. We also intend to share other findings and experiences that have occurred as a result of this project.

This project is one of the family of *Out of the Rock* Education Program activities. *Out of the Rock* is the nation's premiere Mineral Resources and Mining Education program.

INTRODUCTION: ABOUT THE NATIONAL ENERGY FOUNDATION

The National Energy Foundation is a unique 501 (c) 3 non-profit educational organization dedicated to the development, dissemination, and implementation of supplementary educational materials, programs, and courses. These resources for education relate primarily to energy, water, natural resources, science and math, technology, conservation, and the environment and all enrich and enhance teaching and learning. They recognize the importance and contribution of natural resources to our economy, national security, the environment, and our quality of life.

NEF is devoted to the implementation of a variety of innovative teacher training and student programs. The NEF Academy offers several university graduate credit independent study courses developed for K - 12 school teachers. The Foundation, supported by the education community, businesses, government agencies, and associations, has more than two decades of expertise in carrying out educational partnerships.

NEF has become a national leader in forming "partnerships" on behalf of teachers, students, and the education community with a wide variety of businesses, associations, educational institutions, and government agencies.

Energy and natural resources directly impact our environment, our nation, and the world. It is important that the population, especially teachers and students, be educated about the social, economical, political, technological and scientific implications of energy, natural resources, and

environmental choices. NEF strives to achieve this in a responsible, balanced, and objective manner.

NEF's MISSION

The mission of the National Energy Foundation is to provide teaching and learning opportunities, which promote a better understanding of energy, other natural resources, and the environment.

In order to achieve this end, NEF will...

- Provide opportunities for businesses, associations, government agencies, and the education community to participate in the improvement and enhancement of education.
- Develop, produce, and provide cost-effective and affordable supplementary instructional materials about natural resources to aid educators in the teaching process.
- Conduct a wide variety of motivational teacher, employee, and student training programs.
- Provide teachers and students with incentives to participate more intensely in the teaching and learning process.
- Provide support and consultation to sponsors.
- Grow the Foundation in a manner such that it will prosper sufficiently to achieve its mission.
- Carry out an on-going strategic planning process with accompanying financial information, which will be used to prudently manage and administer the Foundation.

NEF SPONSORS AND PARTNERS

Over the years, NEF has provided services and materials to a diverse, numerous variety of satisfied customers. More than 300 public and private electric and water utility companies and over 250 natural gas utility companies have purchased NEF programs, materials, courses, and services as do many, many more schools and individual teachers. Many NEF sponsors also include state energy offices as well as public and private schools, universities and school systems.

PROGRAMS AND SERVICES

NEF believes that education empowers people to achieve at higher levels. This is done through understanding and the application of knowledge, skills, and experience. NEF empowers teachers and learners to take positive action regarding valuable resources.

Custom Programs

Instructional materials are extremely important in teaching and learning, but it is training that intensifies the amount, intensity, and level of implementation. That's why NEF provides a variety of customized teacher training programs. These workshops, conferences, and institutes or "families" of them, are developed and carried out in particular geographic regions. Custom programs include a coordinator, facilitators and implementation committees, instructional materials, evaluation, reporting, etc. Each "program" lasts approximately one year and is usually extended over longer periods of time. Custom programs have been one of NEF's dominant strengths for more than two decades.

Custom Workshops

NEF develops and conducts teacher workshops on a variety of specific natural resource topics or for participating groups of educators. Workshops may be anywhere from a few hours to several days in length depending on the need. Workshops include instructors, materials, field experiences and usually carry graduate credit.

NEF also conducts a variety of other programs such as debates, field trips, student expositions, and competitions and other motivating and inspiring teacher and student programs.

NEF Academy

The Academy is a department within the Foundation that provides a variety of diverse services. Independent study courses are carefully developed to comply with the rigorous academic requirements of accredited universities. Once certified, Academy courses are made available to teachers directly or with corporate scholarship support. Teachers can earn either one or two semester hours of graduate (600 level) credit by satisfactorily completing the approved course.

Custom Services

NEF also provides a variety of custom services including instructional materials development services to meet exacting needs and specifications. NEF custom prints select instructional materials and conducts its unique fulfillment and distribution process in specific geographic regions. The Foundation also provides consultation and assistance services based on our experienced and competent personnel. NEF also develops, maintains, and conducts educational programs for sponsors using the World Wide Web.

Resource Action Programs

Resource Action Programs provide not only instructional materials but also actual technologies to put learning into practice. NEF's RAPs frequently include school-to-home and school-to-work learning experiences. They are also rich in service learning opportunities. Several specific resource action programs are presently available. These include:

Resource Action Pack (Energy Action Patrols or Teams, Living Wise, graduate credit, and the Energy Action Challenge bundled nicely as a school-wide and school-to-home resource action program); Living Wise, NEF's newest and most sought after program, Learning to Be Water Wise , the finest technology based water conservation program available; Energy Action Patrols - one of NEF's most popular programs; Energy Action Teams, and NEF's new and fun Energy Action Challenge.

The action-oriented focus of these amazing programs helps relate behavioral change (learning) to science and technology learning activities, enabling students to actually see and measure how their habits and knowledge can affect the world around them.

These educator-developed programs are built on 26 years of proven development practices, strategies, and materials. They have been extensively field-tested and are widely used.

NEF ACCOMPLISHMENTS

During the past two decades NEF has...

- Distributed well over of a half million instructional posters through journals of the National Science Teachers Association (NSTA).
- Conducted teacher training sessions for over 50,000 teachers.
- Provided more than 4,000 university graduate credit courses through the "NEF Academy."
- Established a nation-wide materials distribution (fulfillment) program now reaching more than 8,000 teachers each year in 46 states.
- Conducted classroom educational programs for nearly a half million students annually, including such popular NEF activities as debates, field trips, competitions and expositions.
- Collaborated in major materials development, distribution, and implementation project alliances with several hundred sponsors from government, industry, associations, and the education community.
- Created and implemented the Igniting Creative Energy Challenge throughout the United States and Canada.

NEF RECOGNITION

NEF has received numerous national energy and environmental education awards from organizations such as the US Department of Energy, The US Bureau of Reclamation's Water Conservation Award, Texas Governor's Clean Texas 2000 Award, and Learning Magazine's Teacher's Choice Awards. NEF has twice been awarded the National Energy Resources Organization's Public Education Award. In 2002, NEF was awarded the "Spirit of the Land" environmental education award by the 2002 Salt Lake Olympic Committee for NEF's outstanding efforts in energy, water, and mineral resources education.

INSTRUCTIONAL MATERIALS

NEF's supplementary materials for teachers, students, and the education community are among the finest in the nation. NEF has developed an extensive collection of unique, educator-developed, classroom-tested instructional materials. These include a multitude of:

- integrated learning activities for grades K - 12
- instructional posters (44 presently available)
- frameworks, glossaries and guides
- kits, videos, CDs, totes, and shirts

NEF is the nation's premier, full-service provider of natural resources-related materials, courses, programs, and services.

OUT OF THE ROCK PROGRAM AND FAMILY OF MATERIALS

During the past few years, the Out of the Rock program has become the premiere mineral resources and mining education program in the nation. It includes a wide variety of educator developed, classroom tested instructional materials. These include the Out of the Rock Teacher's Guide, which includes several sections such as the introduction, from the ground up, supplemental resources, mineral resources glossary, and the unique conceptual framework.

It also includes more than one hundred integrated learning activities designed by grade level. Instructional videos, computer software, T-Shirts / Tote Bags.

Instructional Posters include Mountains to Metals, Mountains to Metals – Spanish version, Rocks and Minerals, Rocks and Minerals – Spanish version, From The Mine To My Home, Aggregates: Nature's Building Blocks, Coal Technology: The Future is Now, Petroleum Technology, Construction Materials and now the Mining Reclamation and Active and Abandoned Mine Safety posters.

Primers include Minerals and the Mining Industry, Coal, Oil, Natural Gas, Water, and Mining Reclamation, and Active and Abandoned Mine Safety.

Training Programs

NEF also conducts a variety of professional development courses and training programs to complement and extend the use of these materials. It has been found that excellent materials coupled with teacher training results in more implementation and implementation over a longer period of time.

RESPONDING TO NEEDS AND FILLING THE GAPS

The Out of the Rock program resulted in the development of a wide range of Mineral Resources and Mining Education materials. They have been embraced and extensively used in select communities, particularly in the West and Mid-west. Through teacher training and additional educator and industry input, it was determined that some additional materials development and distribution was needed. Particularly, on the topic of mining reclamation and active and abandoned mine safety.

It was also felt that instructional materials that would provide instruction about these topics through music should be developed. NEF proceeded to create the "Rock Music" CD and instructional materials to meet this need.

MINING RECLAMATION AND ACTIVE AND ABANDONED MINE SAFETY EDUCATION

After extensive development and implementation of the Out of the Rock program, it was determined that a couple of significant topics needed further development and concentration. These topics included Mining Reclamation and Active and Abandoned Mine Safety.

Plans and strategies were developed, support sought and the projects initiated in phases. The first phase included the development of an instructional poster and primer dealing with Mining Reclamation, the second phase the development of instructional posters and primers dealing with mine safety. Mine safety would also include the production of the instructional poster in Spanish as well and English.

NEF proposed to create beautiful full-color 23" X 35" posters specifically illustrating important mining reclamation and active and abandoned mine safety concepts and practices. The posters were to be similar to several other posters created by NEF. NEF has developed more than forty instructional posters dealing with numerous mineral resources, water, and energy topics. The poster was also to be printed on the backside with additional information and activities for educators.

PURPOSE OF THE PROJECT

There are several important reasons that such a project was needed. Most importantly, teachers, students, and the general public need to know more and understand the importance of mining reclamation and abandoned mine safety. The importance of informing and educating young people and their families is essential. People need to know what is being done to return mined land to beneficial uses. It important they understand that staying out of active and abandoned mine areas could mean staying alive. There are serious problems every year and this message needs to be broadcast loudly in a variety of ways. It was anticipated that these instructional posters would penetrate deeply into schools throughout the nation. Good education in this regard is good business.

UTILILIZATION OF EDUCATIONAL RESOURCES

The posters would have many uses but they were primarily being created for teachers, students, and the general public. They could also be used for home schools, lapidary clubs, recreationists like snowmobilers and 4-wheeler riders, etc. Posters are also being used in libraries and community buildings, at visitor centers, with tourists, and in a variety of public and community relations ways. The posters were intended to be helpful to every state mining reclamation and abandoned mines safety program. They can be used in teacher workshops. They can be given to visitors who inquire about mining reclamation and active and abandoned mine safety state programs when visiting visitor centers or in other ways.

ROLES OF SPONSORS

Project sponsors are important in several ways. The posters need guidance and direction from a technical standpoint. Sponsors also help promote the project with other interested organizations.

PROJECT BENEFITS

It was anticipated that organizations would obtain many benefits by sponsoring and collaborating with this educational project. These would include recognition on the back side of all posters, acknowledgement in magazines, recognition by other organizations, agencies, and businesses who may obtain the posters for distribution in other parts of the country, low prices for posters in the future, and well developed instructional materials devoted specifically to communicating the importance of mining reclamation and active and abandoned mine safety.

FINDINGS AND RECOMMENDATIONS

Sponsor support and participation has been commendable. It has been difficult to obtain, but sufficient to carry out the projects. The projects have been and are being completed on time and within budgets. The support of the National Science Teachers Association has been outstanding. The first magazine insert was extremely well received. The mine safety poster is now scheduled for distribution in the April issue of *Science Scope* magazine.

It is recommended that the project be continued and shared with other interested individuals and organizations. These materials can be of great help to many organizations.

THE FUTURE

Completion of this phase of Out of the Rock will result in welcome and highly usable new instructional materials. The challenge is not so much in making materials, but in seeing that they get into the hands of teachers, students, and the public who can use them.

We urge you to consider ways you can extend the reach of this great program. How can you use these materials within your circle of influence? Join us in reaching out to educators everywhere and help this project reach it's full potential.